

Docket No.: 075353-001



IAP7 Rec'd PCT/PTO 12 JUL 2006 #6
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Giovanni TRIBUZIO, et al.	:	Confirmation Number: 1980
Application No.: 10/529,728	:	Group Art Unit: 1761
Filed: March 30, 2005	:	Examiner: Not Yet Assigned
For: A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR		

SUPPLEMENTAL RENEWED PETITION UNDER 37 C.F.R. § 1.47(a)

Mail Stop PCT
Commissioner for Patents
Office of PCT Legal Administration
P.O. Box 1450
Alexandria, VA 22313-1450
Attention: Office of PCT Legal Administration
Bryan Tung, PCT Legal Examiner/PCT Legal Office

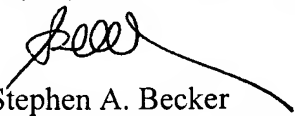
RECEIVED
17 JUL 2006
Legal Staff
International Division

Sir:

Supplemental to the Renewed Petition Under 37 CFR §1.47(a) filed on July 7, 2006, please find the attached Supplemental Renewed Petition Under 37 CFR §1.47(a), wherein a Petition for a three month extension of time is attached, the appropriate Mail Stop and Address are indicated, the correct (current) Declaration of Mr. Franco Guariglia is attached, omitted Exhibits are included, and notation of Attorney Docket Number change is requested.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP


Stephen A. Becker
Registration No. 26,527

**Please recognize our Customer No. 20277
as our correspondence address.**

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 SAB:MWE
Facsimile: 202.756.8087
Date: July 12, 2006

Docket No.: 075353-0013



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Giovanni TRIBUZIO, et al.	:	Confirmation Number: 1980
Application No.: 10/529,728	:	Group Art Unit: 1761
Filed: March 30, 2005	:	Examiner: Not Yet Assigned
For: A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR	:	

SUPPLEMENTAL RENEWED PETITION UNDER 37 C.F.R. § 1.47(a)

Mail Stop PCT
Commissioner for Patents
Office of PCT Legal Administration
P.O. Box 1450
Alexandria, VA 22313-1450
Attention: Office of PCT Legal Administration
Bryan Tung, PCT Legal Examiner/PCT Legal Office

Sir:

On October 19, 2005, Applicant filed a Petition under 37 C.F.R. § 1.47(a) in support of prosecution of the captioned application based on a submitted Declaration executed by the available inventors on their own behalf and on behalf of non-signing inventor Alberto Lodi. The Petition was dismissed on ground that there is no indication that the specification, claims and drawings were presented to Lodi, the letter mailed to Lodi does not specify a date by which Lodi is required to respond, and translations of Exhibits B and C were not provided.

Submitted herewith is a Declaration by Franco Guariglia, legal representative of the Assignee, attesting that he forwarded the complete copy of the Application, Declaration and Power of Attorney form for signature by Mr. Lodi, with response requested within 7 days, that Mr. Lodi in fact received the letter, and that neither signature nor any other responsive

correspondence from Mr. Lodi had been received by Mr. Guariglia. English language translations of non-English documents are included.

It is presumed that the current submission is sufficient to support Petition under 37 C.F.R. § 1.47(a), and that no additional fee payment is required.

Granting of this Petition is believed appropriate and respectfully requested.

Please also note that the Attorney Docket No. has changed from 070222-0014 to 075353-0013.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Stephen A. Becker
Registration No. 26,527

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 SAB:MWE
Facsimile: 202.756.8087
Date: July 12, 2006

**Please recognize our Customer No. 20277
as our correspondence address.**

Barilla G. e R. Fratelli
Società per Azioni

Capitale € 176.440.000,00 i.v.



DECLARATION BY MR. FRANCO GUARIGLIA

DECORTICAZIONE

Re: U.S. Patent Application No. **10/529,728** (national phase of PCT application No. PCT/EP03/10804 filed on 29/09/03 titled: "A process for the production of wheat flour").

Dear Sir:

The undersigned herein states as follows:

1. Franco Guariglia, am a legal representative of Barilla, G. e R. Fratelli S.p.A., the assignee of the subject application.

2. On June 9, 2006, I forwarded a letter to Mr. Alberto Lodi, together with complete copy of the subject application and declaration and Power of Attorney form for signature. I had requested a signature within seven days. See Exhibit A (including translation).

3. Mr. Lodi received the June 9, 2006 letter on June 17. See Exhibit B (including translation).

4. To date, I have not received signature, nor any other correspondence, from Mr. Lodi.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful and false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Parma, July 4, 2006



Parma, 09 GIU. 2006

Oggetto: Domanda di brevetto statunitense N. **10/529,728** (fase nazionale della domanda PCT/EP03/10804 depositata il 29/09/03 dal titolo: "A process for the production of wheat flour" (copia allegata).

Egregio Dottor Lodi,

Le scriviamo per chiederLe la cortesia di voler firmare, dove indicato, il form "Declaration and Power of Attorney", che troverà allegato alla presente unitamente a copia della domanda di brevetto in oggetto, allo scopo di perfezionare il deposito di tale domanda, di cui Lei è uno degli inventori designati.

Le chiediamo dunque cortesemente di sottoscrivere tale documento e di rinviarcelo entro sette giorni dal ricevimento della presente.

*Restando a disposizione per qualunque chiarimento, La ringraziamo anticipatamente e Le
porghiamo i nostri migliori saluti.*

BARILLA G. & R. FRATELLI S.p.A.

All.: C.S.

ALLA G. & R. FRATELLI S.p.A.
G. Frattini

TRANSLATION OF THE LETTER TO MR. LODI OF JUNE 9, 2006

Dr. LODI Alberto

Via Bellini, 48

43023 Monticelli (PR)

Parma, June 9, 2006

Re: U.S. Patent Application No. **10/529,728** (national phase of PCT application No. PCT/EP03/10804 filed on 29/09/03 titled: "A process for the production of wheat flour") (copy enclosed)

Dear Doctor Lodi,

We are writing to you to kindly ask you to sign, where indicated, the form "Declaration and Power of Attorneys" that you will find herewith enclosed together with a copy of the above-referred patent application, in order to perfect the filing of said application, of which you are one of the designated inventors.

Therefore, we kindly ask you to sign said document and to return it to us within seven days from the date of receipt of this letter.

While remaining at your disposal for any clarifications, we thank you in advance and send you our best regards.

BARILLA G. & R. FRATELLI S.p.A.

(signature of Mr. Alberto Guariglia, a legal representative of Barilla G. & R. Fratelli S.p.A.)

Encl.: as above.

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

070222-0014

U.S. APPLIC. NO. (if known, see 37 CFR 1.6)
Not yet assigned

INTERNATIONAL APPLICATION NO

PCT/EP2003/010804

INTERNATIONAL FILING DATE

September 28, 2003

PRIORITY DATE CLAIMED

September 30, 2002

TITLE OF INVENTION

A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR

APPLICANTS FOR DO/EO/US

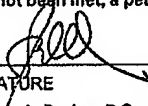
Giovanni TRIBUZIO, Alberto LODI, Angelo GOTTOFREDI and Roberto RANIERI

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached herewith (required only if not transmitted by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not transmitted by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendment has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 18. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A preliminary amendment.
14. ☐ An Application Data Sheet under 37 CFR 1.76.
15. ☐ A substitute specification.
16. ☐ A power of attorney and/or change of address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 37 CFR 1.821-1.825.
18. ☐ A second copy of the published International Application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English translation of the International Application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
 - 1) International Search Report
 - 2) PCT/IB/305

U.S. APPLIC. NO. (if known, see 37 CFR 1.50) Not yet assigned		INTERNATIONAL APPLICATION NO. PCT/EP2003/010804		ATTORNEY'S DOCKET NUMBER 070222-0014	
				CALCULATIONS	PTO USE ONLY
21. <input checked="" type="checkbox"/> The following fees are submitted:					
<input checked="" type="checkbox"/> Basic National Stage Fee \$300				\$300.00	
22. <input checked="" type="checkbox"/> Examination Fee If International preliminary examination report prepared by USPTO and all claims satisfy provisions of PCT Article 33(1)-(4) \$100 All other situations \$200				\$200.00	
23. <input checked="" type="checkbox"/> Search Fee Search fee (37 CFR 1.445(1)(2)) has been paid on the international application to the USPTO as an International Searching Authority \$100 International Search Report prepared and provided to the Office \$400 All other situations \$500				\$400.00	
TOTAL OF 21, 22 and 23 =				\$900.00	
<input type="checkbox"/> Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing or computer program listing filed in an electronic medium). The fee is \$250 for each additional 50 sheets of paper or fraction thereof.				\$0	
Total Sheets	Extra Sheets	Number of each additional 50 or fraction Thereof (round up to a whole number)	RATE		
-100	/50=		X\$250	\$0	
Surcharge of \$130.00 for furnishing the oath or declaration later than 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$130.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	8-20 =	0	x \$50.00	\$0	
Independent Claims	1-3 =	0	x \$200.00	\$0	
Multiple dependent claim(s) (if applicable)			+ \$360.00	\$360.00	
TOTAL OF ABOVE CALCULATIONS =				\$1390.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by 1/2.				\$0	
SUBTOTAL =				\$1390.00	
Processing fee of \$130.00 for furnishing the English translation later than the 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$0	
TOTAL NATIONAL FEE =				\$0	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$0	
TOTAL FEES ENCLOSED =				\$1390.00	
				Amount to be refunded	\$
				Amount to be charged	\$1390.00
<p>a. <input type="checkbox"/> A check in the amount of \$ _____ to cover the above fees is enclosed.</p> <p>b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>500417</u> in the amount of <u>\$1390.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>500417</u>. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <p>SEND ALL CORRESPONDENCE TO: Customer Number 20277 Telephone: 202.756.8000 Facsimile: 202.756.8087</p>					
			SIGNATURE  Stephen A. Becker, P.C.	DATE March 30, 2005	
			NAME 28,527		
			REGISTRATION NUMBER		

BASED ON FORM PTO-1390 (Rev. 2-2005)

Docket No.: 070222-0014

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Giovanni TRIBUZIO, et al.	:	Confirmation Number: Not yet assigned
Application No.: Not yet assigned	:	Group Art Unit: Not yet assigned
Filed: March 30, 2004	:	Examiner: Not yet assigned
For: A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR	:	

PRELIMINARY AMENDMENT

Mail Stop NEW APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to examination of the above-referenced application, please amend the application as follows:

Amendments to the Specification begin on page 2 of this paper.

Remarks/Arguments begin on page 4 of this paper.

IN THE SPECIFICATION

Please insert the following abstract after the last page of the claims in the specification:

ABSTRACT

A process for the production of wheat flour or semolina, comprising the steps of a) wetting the caryopses of wheat with such an amount of water as to bring their moisture content to at least 15%, subjecting them to intense vibrations; b) subjecting the wet caryopses to a conditioning step; c) subjecting the conditioned caryopses to operations of decortication, to take off the outer layers of bran; d) milling the conditioned and decorticated caryopses.

REMARKS

The above-referenced application is amended to include the Abstract of the present International Published Application.

No new matter has been introduced. Entry of this preliminary amendment is respectfully solicited.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Stephen A. Becker, P.C.
Registration No. 26,527

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 SAB:ete
Facsimile: 202.756.8087
Date: March 30, 2005

*Please recognize our Customer No. 20277
as our correspondence address.*

Docket No.: 070222-0014

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Giovanni TRIBUZIO, et al.	:	Confirmation Number: Not yet assigned
Application No.: Not yet assigned	:	Group Art Unit: Not yet assigned
Filed: March 30, 2004	:	Examiner: Not yet assigned
For: A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR	:	

INFORMATION DISCLOSURE STATEMENT

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached form PTO-1449. It is respectfully requested that the references be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is being filed with the application and no certification or fee is required.

A copy of the foreign search report is attached for the Examiner's information. Please note this is a PCT application in the entry of the National Phase in the U.S. and copies of the references cited were transmitted by WIPO and are believed to be in the file of the above identified application and readily available to the Examiner. Therefore it is believed that

Application No.: Not yet assigned

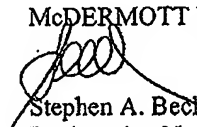
Applicants have met all requirements regarding duty of disclosure under 37 CFR 1.56.

Acknowledgement and consideration of these documents are respectfully requested.

However, to ensure that these references are available to the Examiner, we are providing copies of these references herewith. Since the Search Report was from the U.S., JPO or EPO search authorities, copies of these references should have been supplied to the United States Patent and Trademark Office under the trilateral agreement and are believed to be in the file of the above identified application and readily available to the Examiner.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP


Stephen A. Becker, P.C.
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600 13th Street, N.W.
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Phone: 202.756.8000 SAB:ete
Facsimile: 202.756.8087
Date: March 30, 2005

*Please recognize our Customer No. 20277
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(19) World Intellectual Property
Organization
International Bureau



INTERNATIONAL BUREAU OF PATENT COOPERATION
35, rue de la Harpe, CH-1015, Genève, Suisse
P.O. Box 6859, CH-1211, Genève, Suisse
P.O. Box 18, Armonia, RJ-22461-900, Brazil
P.O. Box 11, 2211, Armonia, RJ-22461-900, Brazil

(43) International Publication Date
8 April 2004 (08.04.2004)

PCT

(10) International Publication Number
WO 2004/028694 A1

- (51) International Patent Classification⁷: B02B 1/04 (74) Agents: BOTTI, Mario et al.; Botti & Ferrari S.r.l., Via Locatelli, 5, I-20124 Milano (IT).
- (21) International Application Number: PCT/EP2003/010804 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 29 September 2003 (29.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
MI2002A002066
30 September 2002 (30.09.2002) IT
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): BARILLA ALIMENTARE S.P.A. [IT/IT]; Via Mantova, 166, I-43100 Parma (IT).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): TRIBUZIO, Giovanni [IT/IT]; Via Telesforo, 31, I-71100 Foggia (IT). LODI, Alberto [IT/IT]; Via Bellini, 48, I-43023 Monticelli (IT). GOTTOFREDI, Angelo [IT/IT]; Via Guareschi, 18/a, I-43036 Fidenza (IT). RANIERI, Roberto [IT/IT]; Via Sanguigna, 130, I-43052 Colomo (IT).
- Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/028694 A1

(54) Title: A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR

(57) Abstract: A process for the production of wheat flour or semolina, comprising the steps of a) wetting the caryopses of wheat with such an amount of water as to bring their moisture content to at least 15 %, subjecting them to intense vibrations; b) subjecting the wet caryopses to a conditioning step; c) subjecting the conditioned caryopses to operations of decortication, to take off the outer layers of bran; d) milling the conditioned and decorticated caryopses.

Title: "A process for the production of wheat flour "

DESCRIPTION

The present invention relates to the foodstuff industry.

In particular it relates to a process for the production of wheat flour and
5 especially semolina from durum wheat (*Triticum turgidum* var. *durum*,
Desf.).

As is known, flour and semolina, respectively from soft wheat (*Triticum aestivum*, L.) and durum wheat, are obtained by grinding the caryopses and subsequently removing the bran.

10 Taking durum wheat as example, the caryopses have a central nucleus consisting of endosperm, a germ, and a coating of various layers constituting the bran and representing about 15% by weight of the caryopsis itself.

The traditional process for the production of flour or semolina foresees a
15 plurality of conditioning phases (3-4) of the caryopses with water and/or steam for 8-12 hours, with the purpose of giving uniformity to and optimising the moisture of the endosperm and at the same time facilitating the separation of the bran. This is followed by milling (breaking, sifting) done by machines provided for that purpose.

20 The finest fractions, consisting mainly of endosperm, together with bran and germ, and separated out by sifting are sent on to successive purification phases.

The coarser fraction, consisting mainly of bran but also of endosperm, is sent to a further milling phase to recover the endosperm.

25 This can be repeated many times, each time producing fine bran and germ particles that are difficult to separate from the endosperm.

This way the final yield of semolina is penalised, as is the quality of the obtained semolina.

Patent EP 0 598 022 describes a procedure for the wetting of cereal grain

- 2 -

that utilises a machine capable of generating vibrations and that leads to a substantial reduction of the time of the single successive conditioning step, with a positive effect on the overall time of the production process.

5 In patent application EP 0 295 774 there is proposed, for the production of wheat flour, an alternative process that mills the caryopses after the selective removal of the various layers constituting the bran.

More precisely, the process according to the aforesaid application provides for the steps of

- 10 1) treating the caryopses with a quantity of water sufficient to condition the outer layers of bran but maintaining the endosperm essentially protected from the water;
- 2) subjecting the thus treated caryopses to friction operations to remove the outermost layers of bran and to successive operations of friction and abrasion to eliminate most of the remaining bran;
- 15 3) conditioning the caryopses with water in a conventional manner and grinding them.

In this way the quantity of bran produced in the milling step is slightly less and the number of crushing steps can be reduced, improving plant productivity.

- 20 According to the teaching of the abovementioned patent application, it is important that the initial conditioning step of the caryopses be carried out with an amount of water of less than 2% of the caryopses weight to avoid the different bran layers fusing together and those more internal remaining attached to the endosperm, making their separation from this
- 25 last more difficult.

Nevertheless the Applicant has found experimentally that the process according to this document of the prior art is certainly appropriate for obtaining different bran layers in good purity through the operations of friction and abrasion described in the application but that it leads to

30 serious inconveniences with regard to the subsequent milling phase, especially when working on the industrial scale.

- 3 -

Indeed, the conventional conditioning phase (with a water amount around 16% by weight of the caryopses weight), carried out on the caryopses stripped of most of their bran husk, gives rise to a packing of the caryopses, these tending to adhere one to the other, with consequent insurmountable technical difficulties in their handling and feeding into the milling machines.

The problem underlying the present invention has therefore been one of making available a process for the production of wheat flour or semolina, in particular the semolina of durum wheat, that permits improvement in the yield of the milling phase with the contemporary reduction of production times and the obtaining of a semolina that adheres perfectly to the severe qualitative regulations in force in Italy. All this avoiding the inconveniences indicated further above in relation to the process according to EP 0 295 774.

15 Summary of the invention

Such a problem is solved, according to the invention, by a process for the production of flour or semolina, from soft wheat or durum wheat respectively, starting from the relative caryopses as such, that includes the steps of

- 20 a) wetting said caryopses with such a quantity of water to bring their moisture content to at least 15%, subjecting the caryopses to intense vibrations;
- b) subjecting the wet caryopses to a conditioning step;
- c) subjecting the conditioned caryopses to decortication
- 25 operations, consisting essentially of an abrasion to remove the outer bran layers;
- d) milling the conditioned and decorticated caryopses.

Preferably the caryopses undergo vibration at frequencies between 50 and 300 Hz, advantageously 75 Hz, generated by means of mechanical, electrical or magnetic energy or else by ultrasound.

Advantageously, the caryopses are exposed to vibration by means of a

- 4 -

machine produced by the company Gräf GmbH & Co. KG, Lahnau, Germany, marketed by the name "Vibronet®".

5 The conditioning step carried out after the caryopses had been subjected to intense vibrations is only one and is advantageously faster with respect to the multiple (3-4) conditioning steps done conventionally, being limited to 4-6 hours instead of the total of 8-12 hours foreseen by traditional conditioning.

10 The process according to the present invention has the great advantage, with respect to that traditionally employed, that does not foresee the decortication of the caryopses before the milling step, to attain a 15- 20 % increase in the hourly throughput of one and the same mill. At the same time, it avoids the inconveniences tied to the presence of bran, like for example flooding and blocking due to variations in the volume of the bran as a function of its moisture content.

15 Moreover the lower amount of bran and germ in the caryopses undergoing milling leads to the production of a flour and semolina with an ash content within the norm even with a greater recovery of the finest fractions with high ash content, with evident advantages for what concerns the semolina and flour yield.

20 With respect to the process according to EP 0 295 774, the process of the present invention gives the marked advantage of avoiding the packing of the caryopses stripped of their bran husk, that occurs during the wetting and conditioning step of the above patent, and still allows easy decortication of the caryopses.

25 In fact, by using the process according to the invention, the fusion of the endosperm with the more internal bran layers complained of in the EP 0 295 774 application does not occur. According to a non-binding hypothesis, it is felt that this depends on the fact that the vibrations imparted to the caryopses during the wetting phase lower the surface
30 tension of the bran layers and allow the water to penetrate rapidly to the central part of the caryopsis and become concentrated in the endosperm, leaving the bran layers relatively dry. In this way fusion between the endosperm and the innermost bran layers is avoided.

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Furthermore it was found that the friction operations described in the application EP 0 295 774 can be omitted without in any way compromising the yield of the overall process or the quality of the final flour. The removal of the bran from the caryopses is therefore entrusted, according to the present process, solely to abrasion operations, with evident advantages in terms of plant simplification and reduction of processing times.

The process according to the present invention will be further described making reference to an example supplied here in the following as illustrative and not limiting.

EXAMPLE

115 kg of durum wheat previously cleaned conventionally had such a quantity of water added to it as to bring the moisture content of the caryopses to 16.5% and was, at the same time, exposed to vibratory stress imparted by a Vibronet® machine (vibratory pulses lasting about 10 seconds and with a frequency of 75 hz). After a single conditioning of 5 hours, the caryopses were fed to a first decortication or abrasion machine, comprising a rotating shaft with vertical axis supporting abrasive Carborundum wheels that peel away the outermost bran layers in the form of bran powder recovered by suction. The caryopses leaving the first decortication/abrasion machine underwent two successive steps in another two decortication machines that provided respectively for the elimination of the intermediate and internal bran layers, always in the form of bran powder. The three bran powders obtained at the outlet of the three decortication machines differ in fibre content, that was maximum in the first bran powder and minimum in the third, and in protein content, this, vice versa, being maximum in the third bran powder and minimum in the first

The caryopses leaving the third decortication machine, of total weight about 100kg corresponding to 87% of the initial weight, underwent air-stream dynamic cooling before being sent to a conventional mill for grinding. Here the decorticated caryopses were ground according to the operative modalities usually used for milling caryopses as such, obtaining at the end 85 kg of durum wheat semolina (74% yield) fully conforming to

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qualitative law requirements. In particular, the ash content was found to conform to the standards as did the particle size and the so-called speckling (in Italian: "puntatura") that, indeed, decreased in both its bran and black components with respect to that of semolina obtained using conventional processes.

Finally it is to be noted that a comparative test carried out on 100 kg of durum wheat from the same lot, subjected to conventional wetting and conditioning for 10 hours with such a quantity of water as to bring the moisture content of the wheat to 16.5%, and then ground without any prior decortication, in the same experimental and operative conditions as the above example, gave 70 kg of semolina, a yield equal to 70%.

As is noted on comparing the two tests, the process according to the invention supplies a higher yield than that of the conventional process. But there is another important advantage of the process according to the invention, and this consists of the possibility of notably increasing the plant milling capacity because the caryopses bear a very reduced bran residue amount and there is no further need to carry out any of the numerous passages (breaking) typical of the conventional milling process.

In the course of the operations on the industrial scale it was confirmed that the flow rate of the decorticated wheat fed to the mill was 15.20 t/h against a flow rate of 12.87 t/h found in the same mill when it was fed non-decorticated wheat.

Always operating on the industrial scale, the process according to the invention resulted in a 75.2 % yield of semolina by weight of the initial durum wheat, whereas the maximum yield obtained with the conventional processes in one and the same mill was 70.1%.

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CLAIMS

1. A process for the production of wheat flour or semolina starting from respective caryopses as such, that includes the steps of
 - a) wetting said caryopses with such a quantity of water as to
5 bring their moisture content to at least 15%, by subjecting them to intense vibration;
 - b) subjecting the wet caryopses to a conditioning step;
 - c) subjecting the conditioned caryopses to decortication operations, consisting essentially of abrasion, to remove the bran;
 - 10 d) grinding the conditioned and decorticated caryopses.
2. A process according to claim 1, in which the said wetting step is carried out while subjecting said caryopses to vibrations of a frequency between 50 and 300 Hz.
3. A process according to claim 2, in which said vibrations are generated
15 by means of mechanical, electrical or magnetic energy or else by ultrasound.
4. A process according to claim 3, in which said conditioning step has a duration of 4-6 hours.
5. A process according to any one of the preceding claims, in which said
20 caryopses as such are caryopses of durum wheat.

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/EP 03/10804A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B02B1/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B02B B02C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 399 839 A (HERMAN ANDERSON ET AL) 3 September 1968 (1968-09-03) column 1, line 9 - line 12 column 1, line 68 - line 71 column 2, line 48 - column 4, line 8 figure 1	1-5
Y	US 5 586 492 A (GRAEF DIETER O) 24 December 1996 (1996-12-24) column 1, line 62 - column 2, line 55 column 3, line 1 - line 4	1-3
Y	US 4 189 503 A (GIGUERE JAMES R) 19 February 1980 (1980-02-19) column 3, line 56 - line 66 column 6, line 52 - line 61 column 9, line 30 - line 46	1, 4
	-/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex

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Date of the actual completion of the international search

29 January 2004

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INTERNATIONAL SEARCH REPORT

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 986 997 A (POSNER ELIESER S ET AL) 22 January 1991 (1991-01-22) column 4, line 59 column 5, line 7 - <u>line 28</u>	1,5

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/EP 03/10804

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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US 4986997	A	22-01-1991	NONE	

Docket No.: 070222-0014

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter claimed and for which a patent is sought on the invention entitled A PROCESS FOR THE PRODUCTION OF WHEAT FLOUR, the specification of which

- ☐ is attached hereto.
☒ was filed on _____ as United States Application Number _____, or PCT International Application Number _____ and was amended on _____ (if applicable), or
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I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability in accordance with Title 37, Code of Federal Regulations, Section 1.56 including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

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PCT/EP03/10804	PCT	September 29, 2003	<input checked="" type="checkbox"/> <input type="checkbox"/>

I hereby claim the benefit under 35 United States Code, Section 119(e) of any United States provisional application(s) listed below.

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Prior U.S. Application(s):

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POWER OF ATTORNEY:

As a named inventor, I hereby appoint the registered practitioners of McDermott Will & Emery LLP, included in the Customer Number provided below, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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Avviso di ricevimento



Raccomandata



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Assicurata

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Numero

Data di spedizione 09 GIU 2006 PARMA

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Destinatario SIG. ALBERTO LODI

Via Via Bellini 48

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CA 0004-0

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